

RECENT DEVELOPMENTS IN THE TRAINING OF ARTIFICER APPRENTICES

by

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The Series Training Scheme for Artificer Apprentices has now (January 1950) been in operation for two years. This would therefore seem an appropriate moment at which to take stock to see how far the scheme can be deemed to have succeeded, at least from the Part I, or Preliminary Training, point of view. As the first class of purely "Series Trained" Apprentices does not complete its training until December 1951,* final judgement must be reserved for several years and until those so trained have had time to prove their worth at sea.

In order to assess fairly the merits (or otherwise) of the new scheme compared with the old, a brief reference to the latter must be made. The exact location and structure of the Training Establishments has varied considerably from time to time, but just prior to the change over were as follows :—

THE OLD SCHEME

Artificer apprentices, between the ages of 15 and 16.4 months, were entered at six-monthly intervals and were given a four-year course at one of two parallel establishments, H.M.S. *Fisgard*, Torpoint, Cornwall, and H.M.S. *Caledonia*, Rosyth, Scotland. On arrival at these establishments they had already been allocated to one of the four main Branches then available, *i.e.* Engine Room, Ordnance, Electrical or Aircraft, depending on their pre-entry preferences and on the entrance examination results.

Aircraft apprentices remained for 12 months only before moving on to H.M.S. *Condor*, Arbroath, to complete their four years' training. Training consisted of :—

<i>School and Technical</i> ...	1st and 2nd Years—School subjects only.
	3rd and 4th Years—Technical subjects—Mechanical Drawing, etc.
<i>Factory</i> ...	1st Year—Bench work, Marking Off, Drilling.
	2nd Year—Shapers and Bench work. Outside Trades and Turning.
	3rd Year—Tool Room and Turning. I.C.E. Running, Practical Electrics, Gunnery School.
	4th Year—Afloat work. Turning and Test Job. (<i>N.B.</i> —Productive work in 3rd and 4th years.)

* It should be mentioned that two Classes were entered in the "change-over" period between May, 1947, and January, 1948, who were to be "Series Trained" but who had been allocated Branches before entry.

		PRE-ENTRY	2ND TERM	3RD TERM	FINAL ALLOCATION
JAN. 1948	AIRCRAFT	17 (10.8)	16 (10.1)	36 (22.9)	36 (22.9)
	ELECTRICAL	71 (45.0)	66 (42.0)	49 (31.2)	35 (22.3)
	SHIPWRIGHT	3 (1.8)	15 (9.5)	18 (11.5)	21 (13.4)
	ORDNANCE	7 (4.4)	13 (8.2)	12 (7.7)	18 (11.5)
	ENGINE RM	59 (38.0)	48 (30.2)	42 (26.7)	47 (29.9)
	TOTAL	157 (100.0)	158 (100.0)	157 (100.0)	157 (100.0)

TABLE 1

Main Faults of the Old System

The main disadvantages of such a system may be summarized as follows :—

1. The choice of a Branch was made by or for an apprentice before he had had any experience of the Service or of the Branch selected and before he had a chance to show any aptitude for it. Figures in table 1 show how ignorant most apprentices are of the opportunities offered by Branches other than Engine Room and Electrical. It is also of interest to note that E.R.A. apprentices were expected to select a trade at the end of their first term of six months.

2. Four years at the same Establishment was generally too long for all but the most stable type of youth, from both an academic and a disciplinary point of view. A general lack of interest in work was often noticeable during the 2nd and 3rd years, while the problem of legislating for boys of 15 and youths of 20 was a difficult one. Minor crimes increased steadily until the end of the third year when thoughts of " Passing Out " had their salutary effect. Child's Report, 1946, p. 38, states " there is much to be said for splitting up the lengthy course into two halves so that all apprentices spend their first two years in one establishment and their second two years in the other. Besides giving them the benefit of the greater facilities at Rosyth it would also do much to relieve the monotony of four years' hard training in one place, coming as it does at a naturally restless age." The same remarks apply equally well to *Collingwood* and *Condor*.

3. The six-monthly scheme of entry was out of step with the country's educational system of three terms per year.

4. The horizontal divisional scheme or " term system " inevitably led to segregation of apprentices into terms and into Branches within those terms.

5. There was no general basic training for all Branches, with a result that the sympathetic outlook on the " other fellow's " point of view was often missing.

THE NEW SCHEME (January 1948)

Artificer apprentices, who enter at four-monthly intervals in January, May and September between the ages of 15 and 16.8 months* are given a four-year course. The first sixteen months (four terms) of this consists of Part I or basic training at H.M.S. *Fisgard* before proceeding to their Part II or advanced training of 32 months (eight terms) at one of the following :—

- (a) H.M.S. *Caledonia*, Rosyth, for Engine Room, Ordnance and Shipwright Artificer Apprentices.
- (b) H.M.S. *Collingwood*, Fareham, for Electrical Artificer Apprentices.
- (c) H.M.S. *Condor*, Arbroath, for Aircraft Artificer Apprentices.

* This latter figure is on trial for three years, see A.F.O. 480/49.

A competitive Admiralty examination is taken by all candidates, who enter as Artificer Apprentices and without any Branch having been allocated to them. The holding of a school certificate or the equivalent exempts a candidate from the written examination, but every boy is subjected to an interview and to aptitude tests by an Admiralty Selection Board,* thus ensuring a sufficiently high standard of intelligence and suitability, and finally to a stringent medical examination. The following table shows the percentages of those actually accepted compared with applicants to date :—

Date of Examination	Applicants	Apprentices Accepted	Percentages
October, 1947	616	159	25.8
February, 1948	483	166	34.3
June, 1948	514	159	31.0
October, 1948	405	185	45.7
February, 1949	423	150	35.5
June, 1949	550	184	33.5

Divisional

Eight Divisions named after famous Admirals, whose names conveniently begin with the first eight letters of the alphabet, have Divisional Officers from the five Branches in which apprentices will eventually emerge from *Fisgard*. Thus, there are two Lieutenants (E), one Lieutenant (E) (A/E), two Lieutenants (E) (O/E), two Lieutenants (L) and one Commissioned Shipwright (in lieu of a Shipwright Lieutenant). To assist them two Instructor Officers are attached to each Division to act as "Tutors." They teach only the apprentices in their Division and work in close co-operation with their Divisional Officers both in school and out-of-school activities such as coaching and refereeing the various games. Finally, each Division has a Chief or Petty Officer attached to it, who is normally, but not necessarily, of the Seaman Branch (at present, for instance, two are C.P.O. Air Mechanics and one a C.P.O.S.M.).

The living quarters are adequate but far from ideal, consisting as they do of three brick huts of about 60 ft by 18 ft 6 in per Division. This means that the 30 apprentices per hut have to sleep in two-tier beds, added to which no central heating is at present fitted, bogies being used instead. Unfortunately other amenities are not much better. Apprentices have no gymnasium of their own (although a neighbouring establishment, H.M.S. *Raleigh*, has been very generous in loaning theirs); there is no swimming bath and the number of playing fields is quite inadequate. Great efforts have been made to improve this state of affairs and it is believed that these may achieve a measure of success in the not too distant future.

Training

Training in H.M.S. *Fisgard*, based on three 14-week terms per year and on a 39-hour week, consists of a progressive course of Workshop and School

* The Personnel Selection Officer and Medical Officer from *Fisgard* are now permanent members of these two Boards to ensure continuity.

subjects only, virtually all Technical subjects being taught at the Part II Training Establishments.*

New Entry

The New Entry Training of two weeks at the beginning of I Class consists of the usual kitting-up, parade-ground work, films and lectures on the Service, P.T. and games, etc. For a further two weeks New Entries depart from the normal instructional routine during the afternoons only, when ship visits, boat pulling, rifle shooting, etc., are arranged.

School

The following subjects are taught : Mathematics, Mechanics, Science (Heat and Electricity) and English. Naval History and Adult Education (Current Affairs) are taught to IV Class only.

School Examinations

Apprentices are examined twice in school subjects, at the end of their second and fourth terms. The former is a local examination set and marked in *Fisgard*, the latter an Admiralty Part I examination of approximately matriculation standard, the results of which count towards final seniority, as follows :—

75% and over	...	...	1st Class	...	...	4 weeks' seniority.
65% and over	...	...	2nd Class	...	...	2 weeks' seniority.
55% and over	...	...	3rd Class	...	...	1 week seniority.
40% and over	...	...	Pass	...	...	No seniority.

Failure to obtain 40% means that an apprentice will either pass on to his Part II Establishment with an Admiralty Warning, be put back a term, or discharged as unsuitable, depending on the circumstances. The action taken is decided at an Admiralty conference at which all Artificer Training Establishments and interested Admiralty Departments are represented.

The object of holding a local examination at the end of an apprentice's second term is to find out what progress he has made since joining and to discover likely failures in the Admiralty Part I examination. These are awarded extra study in the subjects in which they have failed. Extra tuition during the dog watches on Wednesdays and week-end test papers are given until a 50% mark is achieved in each subject.†

In addition to these two examinations certain outside examinations are encouraged, and special tuition is given to apprentices sitting the

R.N. College, Dartmouth, 16-year-old Entry.

‡ Cambridge School Certificate.

Special Entry Examination.

the first two being actually held in *Fisgard*.

Workshops

The Workshop syllabus (the word Factory is no longer used), has been

* It will be seen from Summary on page 113 that there are certain exceptions to this. For instance, Electrical Artificer Apprentices in their fourth term are given 6½ hours Laboratory training in electrical experiments to meet the requirements of H.M.S. *Collingwood*. The Branch lectures, however, are more explanatory than technical.

† In addition, Special Study is given to any Apprentice during his first two terms whose school mark in any subject was low on entry, and to any obvious "laggards."

‡ The examination fee of £2 5s. 0d. will, in future, be paid by the Crown for candidates approved by the Commanding Officer, H.M.S. *Fisgard*.

designed to give an apprentice as much experience as possible in the various trades allied to the five different Branches before branch allocation. Not every trade can be fully covered, however, as branch allocation has to take place towards the end of an apprentice's third term.

The detailed syllabus is as follows :—

Class	Instruction	Weeks	
I	New Entry Training	2	
	Woodwork	12	
II	Fitting Bench	11	
	Drilling	2	
	Marking Off	1	
III	Coppersmith	5	
	Sheet Metal	2½	
	Engine Smith	2½	
	Welding	2	
	Tool Room	2	
IV	E.R.A.'s } Lathes	9	
	O.A.'s } Milling	3	
	E.A.'s } Shaping	2	
	Aircraft ... } Fitting Bench	9	
		Lathes	3
		Sheet Metal	2
		Shipwright ... Light Plate Work ...	14

Summary

A summary of the instructional routine is :—

Subject	I Class	II Class	III Class	IV Class	IV Class (L)
Workshops	23	24½	25½	26½	20
School	7½	8	8	10*	16½†
Branch Lecture	1	1	1	—	—
Metal and Woods Lectures ...	1	1	—	—	—
Naval Lecture	1	—	—	—	—
Drill	2	1	1	1	1
Physical Training	1	1	1	1	1
Religious Instruction	½	½	½	½	½
Camp Duties	2	2	2	—	—

* Add Adult Education and Naval History (1 hour each).

† Add Adult Education and Naval History (1 hour each) and Electrical Laboratory work (6½ hours).

Total hours week = 39.

Miscellaneous

In addition to school and workshops, apprentices receive instruction in elementary Field Training, Physical Training (up to and including Table 4) and Religious Instruction. During their first three terms they are given seven one-hour Branch lectures by Officers of the five different branches (*i.e.*, 35 lectures in all) ; during their first two terms they have a one-hour lecture weekly on woods or metals and in their first term a one-hour lecture each week from their Divisional Officer on Service Customs, the Organization of the Royal Navy, etc. In their first three terms all apprentices spend two hours per week cleaning their living quarters (camp duties) to ensure that they become "house trained."

Afloat Training

The desirability of giving apprentices "afloat" training as a means of helping them in their Branch allocation was soon realized, and arrangements were made with H.M. ships in Reserve and with those of the Local Flotilla for apprentices to visit them. Later it was arranged for every apprentice to visit the R.N. Air Station, St. Merryn (H.M.S. *Vulture*) and to be given a short flight in a suitable aircraft. These visits, etc., may be summarized as below :—

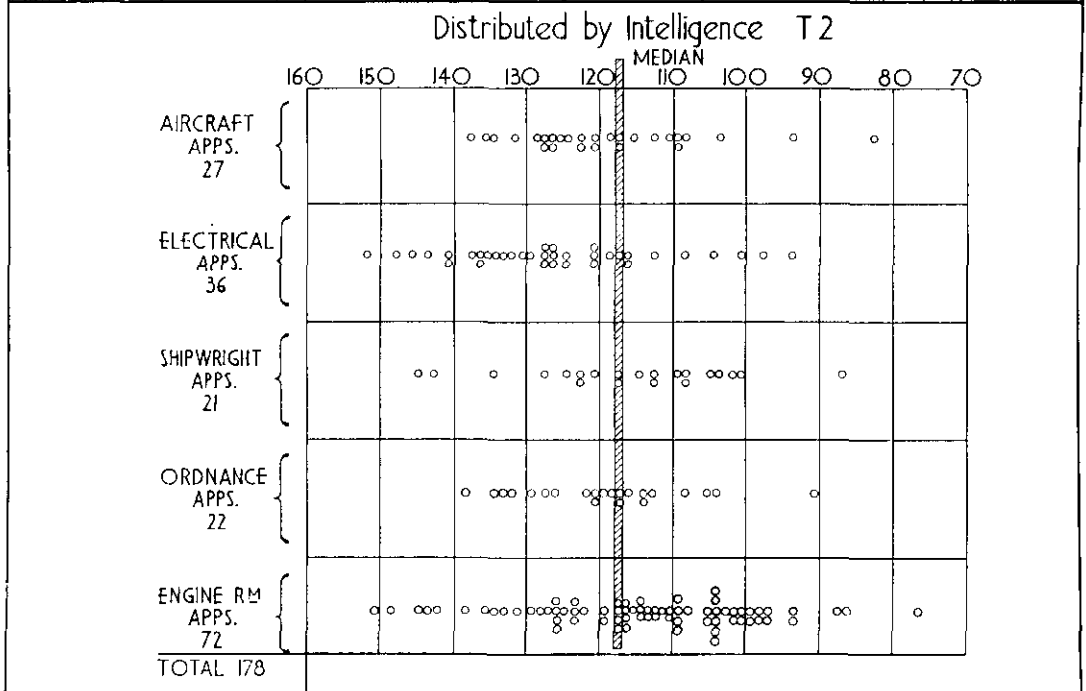
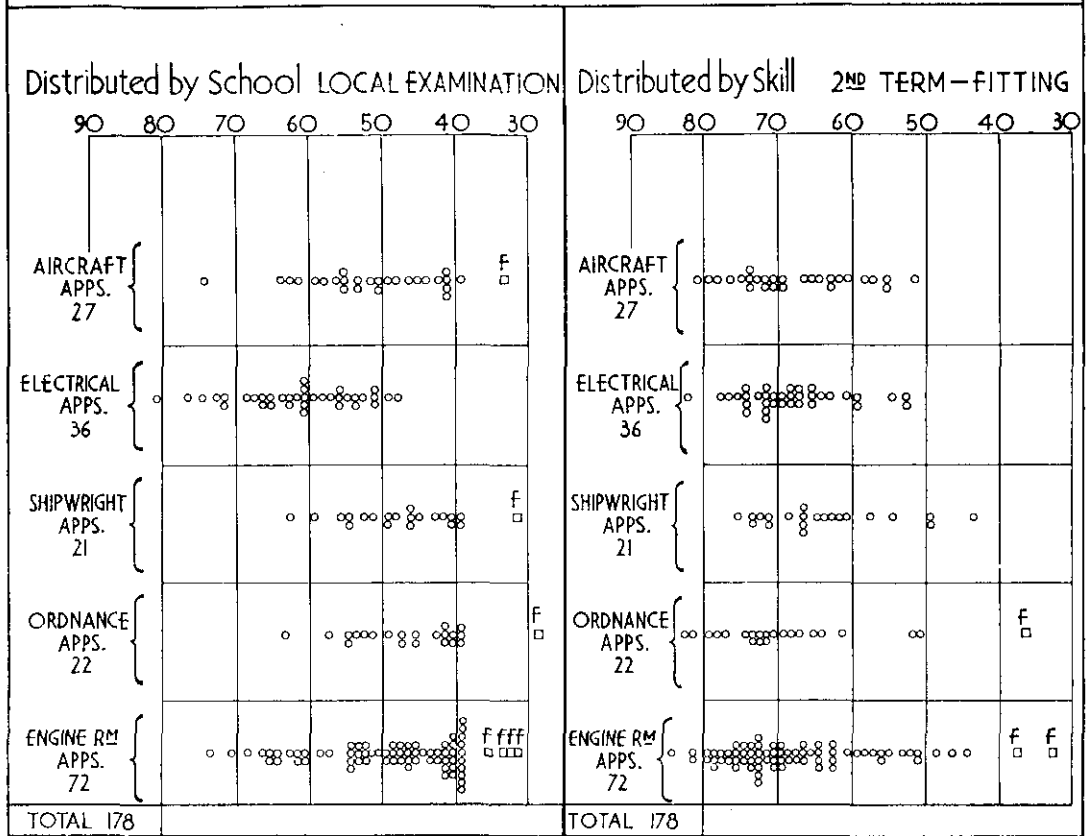
<i>Term</i>	<i>Nature of visit</i>	<i>Maximum numbers visiting at any given time</i>	<i>Remarks</i>
I (New Entries)	Afternoon visit to any suitable ship in H.M. Dockyard, but preferably a Battleship or Fleet Carrier. (New Entry Officer in Charge.)	2 Divisions (max. 50)	"Schoolboy's" Tour.
II	Day sea trip in a ship of the Local Flotilla. (Divisional Officer in Charge.)	1 Division (max. 25)	Destroyer or Frigate. (Destroyer preferred.)
III	Two whole day visits with appropriate (E) (O/E), (L) and Shipwright Officers to cover all four Branches (two in forenoons, two in afternoons).	2 Divisions (max. 50). Split into two equal groups.	Formerly H.M.S. <i>Newfoundland</i> now H.M.S. <i>Howe</i> .
III	Whole day visit to R.N.A.S. St. Merryn, with (A/E) Officer in Charge.	1 Division (Max. 25)	—

It is true that these visits, except those of the New Entries, have to take place during normal working hours, but their value is now beyond doubt and the total time lost is, in any case, only a very small percentage of the whole.

BRANCH ALLOCATION

The original directive from the Engineer-in-Chief's Department on this all-important subject read as follows, "At the end of the third term Branch Allocation takes place, it being felt that by this time sufficient information

TYPICAL ENTRY. (JANUARY 1949)



regarding aptitude and ability will be available to ensure apprentices being selected for the Branch for which they are most suited. As far as possible selection will depend on choice, but will be arranged so that there will be an equitable distribution of talent among the various Branches."

This set two distinct problems. First, were these two conditions, in fact, compatible and if not, to what extent should one disregard an apprentice's choice in order to ensure an equitable distribution of talent, or vice-versa ?

Secondly, how was one to define talent ? Was it a measure of an apprentice's skill in the workshops, of his scholastic capabilities or of his intelligence as measured by his T.2 score on entry ? Fortunately these problems have so far largely solved themselves in that Admiralty requirements have been met (to within a few per cent) without any marked disparity between the five Branches. Figures on page 115 show how talent is distributed for a typical entry (January, 1949). These are based on :—

- (a) A " Skill " mark obtained from workshop results at the end of the second term (fitting).
- (b) Local school examination results at the end of the second term.
- (c) T.2 intelligence test on entry.

These diagrams show that although the Electrical Branch tends to benefit to a certain extent as far as " school talent " is concerned (which is only right and proper in view of the high scholastic standard necessary to complete the course in H.M.S. *Collingwood*), the general picture is very satisfactory, with skill being well distributed.

Branch Preferences

It soon became vital to set up some organization for obtaining accurate information as to how apprentices' preferences for the various Branches varied as their training progressed. A Personnel Selection Officer was therefore appointed to the staff for this purpose, and interviews, when apprentices are asked to state their first, second and third choice, are now given by him at intervals during training, thus :—

Pre-Entry

This is useful as a starting point. It shows also how ignorant most boys are of the Branches available to them in the Service. Table on page 117 (which is typical) shows a large preponderance for the Electrical and Engine Room Branches, Ordnance and Shipwright Branches being poorly patronized.

At the End of Second Term

By this time an apprentice will have completed his time in the woodworking and fitting shops, will have had about five of the seven branch lectures due to him and will have been to sea for a day in a sea-going ship. If the more popular Branches are quite obviously going to be " over-subscribed " at the time of final selection, the data obtained by the Personnel Selection Officer enables the Commanding Officer to address the apprentices and inform them of the position so that they can discuss the situation with their parents during the leave period before final allocation.

Towards the End of Third Term

About nine weeks after the beginning of an apprentice's third term he has to state his final choice. It has been found by experience that this is the latest date possible, bearing in mind that much has to be done between then and the end of term. By this time also all branch lectures and ship visits will have

ANALYSIS OF PRE-ENTRY CHOICES								
	JAN. 1948	MAY 1948	SEPT. 1948	JAN. 1949	MAY 1949	SEPT. 1949	JAN. 1950	AVERAGE
AIRCRAFT	17 (10.8)	23 (14.4)	22 (13.8)	23 (12.4)	11 (8.3)	37 (20.1)	16 (7.9)	21.3 (12.5)
ELECTRICAL	71 (45.0)	62 (38.7)	73 (46.3)	69 (37.3)	65 (43.3)	76 (41.3)	98 (48.3)	73.4 (42.9)
SHIPWRIGHT	3 (1.8)	8 (5.0)	11 (6.9)	12 (6.5)	9 (6.0)	12 (6.5)	17 8.4	10.3 (5.8)
ORDNANCE	7 (4.4)	8 (5.0)	5 (3.2)	4 (2.2)	5 (3.3)	10 (5.45)	11 (5.4)	7.1 (4.1)
ENGINE RM	59 (38.0)	59 (36.9)	47 (29.8)	77 (41.6)	60 (40.0)	49 (26.65)	61 (30.0)	58.9 (34.7)
TOTAL PER ENTRY	157 (100.0)	160 (100.0)	158 (100.0)	185 (100.0)	150 (100.0)	184 (100.0)	203 (100.0)	171 (100.0)

been completed and at least three of the five shops in the allied trades section will have been visited.

Actual Method of Branch Selection

So far Admiralty requirements in each of the five Branches have been communicated to *Fisgard* on a term-to-term basis, as follows :—

	Christmas, 1948	Easter, 1949 : Summer, 1949	Christmas, 1949
Aircraft Artificer Apprentices	21½%		11%
Electrical † „ „	21½%		26%
Engine Room* „ „	32%		37%
Ordnance „ „	11%		14%
Shipwright „ „	14%		12%

The Commanding Officer may use his discretion in departing from these percentages within very narrow limits to meet exceptional cases. Thus the numbers required are known to all.

The Personnel Selection Officer, having interviewed every apprentice (for the third time) and having obtained his first, second and third choice, then prepares the first of several lists showing how the balloting has gone and which Branches are over and which are underborne. Before proceeding further each apprentice has to be checked as to his suitability for the Branch selected from every point of view (it is obvious, for instance, that a school failure in electricity must not

* E.R.A. Apprentices are allocated trades at the end of their fourth term in *Fisgard* on a basis of :—

Fitter and Turner...	...	...	...	70%
Boiler Maker	...	...	...	18%
Coppersmith	...	...	...	9%
Enginesmith	...	...	...	3%

Patternmakers and Moulders being obtained by Direct Entry.

† Electrical Artificer Apprentices are sub-divided as follows at the end of their fifth term, *i.e.*, after one term in H.M.S. *Collingwood* :—

E.A. Ship	...	...	...	70%
Radio E.A. Ship	...	...	...	15%
E.A. Air	...	...	...	10%
Radio E.A. Air	...	...	...	5%

be placed into the Electrical Branch nor must a boy with low skill marks in woodworking be made a Shipwright). One is then left with a number of "certainties" and a "floating vote" to fill the vacancies still existing. Having decided the best way of allocating the latter, preference being given as a result of workshops and school results to date, each apprentice has to be interviewed in turn by the Training Commander and Personnel Selection Officer and the position explained to him. In nearly every case an apprentice can be convinced that the proposed allocation is a fair and reasonable one, especially if no worse choice than a "second" is involved, but occasionally there is the awkward customer who just will not be convinced. Such "square pegs" may need to be reminded that they signed an agreement on joining to the effect that they would be willing to be placed in any one of the five Branches, but this is considered undesirable unless all else fails.

Provisional lists are then produced and displayed in some prominent position. Apprentices are thus given a final chance to change their Branch should they be still dissatisfied, although at this stage only a direct exchange of "one for one" is usually entertained, and then only if it is considered that both parties would do better in the new Branch. The final lists are promulgated by the Commanding Officer, usually about a fortnight after Branch Allocation began.

Results of Branch Allocation

The actual results so far are as follows :—

	Nov. 1948	March 1949	July 1949	Nov. 1949
No. of apprentices obtaining first choice...	143	145	137	168*
No. of apprentices obtaining second or worse choice	14	15	21	10

Although it is perhaps early yet to say whether the scheme, in so far as Branch Allocation is concerned, has proved successful (the apprentice tending to be a fickle bird), one can point to the fact that more than 90% of those leaving *Fisgard* do so as "contented customers," which should eventually lead to a greater proportion of satisfied artificers.

Trade Allocation. (Engine Room Artificer Apprentices)

A similar but more simple procedure is used for classifying E.R. Artificer Apprentices at the end of their fourth term. The basis for this allocation is workshop skill only, due consideration being placed on a boy's ability in any particular phase of his training. Percentages at present in the various trades are shown on page 117.

The actual results obtained are shown in the following table :—

	Dec. 1948	April 1949	August 1949	Dec. 1949
No. of apprentices obtaining first choice...	45	41	42	41
No. of apprentices obtaining second or worse choice	14	7	6	9

* In fairness it should be stated that the actual allocations in this case differed slightly from Admiralty requirements. This was due to the fact that revised percentages were communicated by the Admiralty within a month of the allocations being due to take place. In order not to disappoint apprentices who, by this time had mostly made up their minds, approval was sought and given for slight discrepancies, on the understanding that these would be made up within the next year.

These figures, although not so convincing as those for Branch Allocation, show almost 80% of "contented customers," such failures as there are being due largely to the fact that the billets for Boilermaker (18% of the whole) are difficult to fill.

Personnel

This article would be incomplete without a brief reference to the organization of *Fisgard* from a personnel angle, this having altered somewhat since Series Training was introduced.

A Captain (E) is in command of the Establishment, with one Commander (E) as Executive Officer and another as Training Commander. The Executive Officer has a First Lieutenant, a Lieutenant Commander (E), as his assistant and responsible to him for Field Training, Ship's Company Divisional Duties and Civilians (excluding Workshop Instructors) and to the Training Commander for New Entry Training. The eight Divisional Officers are, of course, responsible to the Executive Officer for all disciplinary and divisional matters and to the Training Commander for Branch lectures, etc. The P.T. and W.O., a Lieutenant (E), and his staff also come under the jurisdiction of the Executive Officer, as do the Medical and Dental Officers.

On the Training side there are the two distinct divisions of School and Workshop. The former has an Instructor Commander, as "Headmaster," and his assistant, an Instructor Lieutenant Commander, with sixteen Instructor Officers as "Tutors." The latter has a Senior Engineer, a Lieutenant Commander (E), for the overall organization of the Workshops and Instructors, both active service and civilians, and the maintenance and replacements of workshop buildings, machinery, etc. Workshop Officers (one for each term) are responsible to the Senior Engineer for their own sections of the workshops, but to the Training Commander direct for the actual "training" side, such as Extra Workshops, backward apprentices, etc. A civilian foreman is responsible to the Senior Engineer for the discipline and welfare of all Instructors, who are at present borne in the following proportions :—

Active Service ...	...	...	...	...	17
Pensioners ...	...	...	...	...	29
Dockyard ...	...	...	...	...	17
					—
					63*
					—

Conclusion

This article has not gone into Part I training in any great detail, but has attempted to present it as a fairly general picture. We in *Fisgard* believe this period to be vital in an artificer's Service life. He joins us as a young school-boy (probably with long hair), almost certainly knowing very little about the Royal Navy and the part he will have to play in it. He leaves us, sixteen months later, an Artificer Apprentice belonging to one of the five Branches; disciplined, smart, knowing where he's going, and not without knowledge of basic craftsmanship. From then on he becomes the responsibility of either H.M.S. *Caledonia*, *Collingwood* or *Condor*. We hand on the torch to them.

* Based on a total of 756 Apprentices, *i.e.*, one Instructor for every 12 Apprentices. In addition, five Leading Instructors are allowed for supervision in the various workshops and one Instructor for Test Job Marking.